

Minnesota Fact Sheet 374b Farmstead Energy Improvement Heating and Ventilation

Purpose

The purpose of this practice is to implement improvements to reduce or improve energy efficiency of on-farm energy use.

Ventilation

Independent performance testing of fans is provided by the Bioenvironmental and Structural Systems (BESS) Laboratory at the University of Illinois. The website is <http://bess.illinois.edu>.

Exhaust Fans



Exhaust fans are used to pull outside air through a building. They are typically used in tunnel or cross ventilation systems.

Horizontal Air Flow Fans

Circulation fans within the building provide air mixing within a building by establishing a horizontal air circulation pattern within the building.



High Volume Low Speed Fans

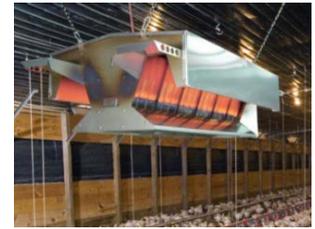
HVLS fans are large diameter (typically 10 – 25 foot diameter) circulation fans which move large volumes of air with a low circulation speed.



Heating

Radiant Tube Systems

Radiant tube heaters transfer heat directly to objects and animals in a facility, similar to the heat that emanates from a wood stove, rather than heating the building by circulating hot air throughout the structure. Radiant heat systems are not as dependent on proper air circulation as forced air heating in order to distribute heat throughout the building.



High Efficiency Heaters

Heating agricultural buildings is a significant energy demand for many facilities. Replacing less efficient heating systems with high efficiency heaters reduces the amount of energy to maintain desired temperatures in the building.

Attic Heat Circulation

Attic vents or inlets can be operated in colder weather in order to allow dry warm air from the attic area of buildings to circulate throughout the building. This is often done for air quality reasons, but using warmer air from the attic can also reduce the heating requirements for the building, and improved circulation may reduce loads on ventilation equipment also reducing energy usage.

Root Zone Heating

Root zone heating delivers radiant heat to the root zone level of plants rather than heating the surrounding air in the greenhouse. Typical root zone heating systems include radiant bench heating and quad radiant systems.